

WHAT IS CLAIMED:

1 1. A method of generating a reinforced
2 polymer, the method comprising:
3 providing particles of the layered silicate and
4 a supercritical fluid;
5 mixing the layered silicate particles with a
6 polymer to form a treatable silicate-polymer mixture;

7
8 contacting the treatable mixture with the
9 supercritical fluid to exfoliate the silicate so that the
10 silicate particles disperse within the polymer; and
11 depressurizing the contacted mixture to
12 exfoliate the silicate particles so that the layers are
13 substantially dispersed within the polymer to define a
14 reinforced polymer.

1 2. The method of claim 1 wherein the
2 supercritical fluid is carbon dioxide.

1 3. The method of claim 1 wherein contacting
2 the mixture includes pressurizing the mixture with the
3 supercritical fluid to above the critical pressure of the
4 supercritical fluid.

1 4. The method of claim 1 wherein contacting
2 the mixture includes heating the mixture with the
3 supercritical fluid to above the critical temperature of
4 the supercritical fluid.

1 5. The method of claim 1 wherein contacting
2 the mixture includes maintaining contact for between 0.5
3 minute and 10 hours.

6. The method of claim 1 wherein the silicate particles are substantially singly dispersed upon depressurization.

7. The method of claim 1 wherein the reinforced polymer includes between about 0.1 and 40 percent weight of the silicate particles.

8. The method of claim 1 wherein mixing includes shearing the silicate-polymer mixture.

9. A reinforced polymer comprising:
a polymer; and
a layered silicate having particle layers exfoliated by a supercritical fluid, the particle layers being substantially dispersed within the polymer to provide reinforcement to the polymer.

10. The reinforced polymer of claim 9 wherein the supercritical fluid is carbon dioxide.

11. The reinforced polymer of claim 10 wherein the supercritical fluid is pressurized above about 1100 pounds per square inch gauge and at a temperature above about 30 degrees Celsius.

12. The reinforced polymer of claim 9 wherein the layered silicate comprises between about 0.1 and 40 percent weight of the reinforced polymer.